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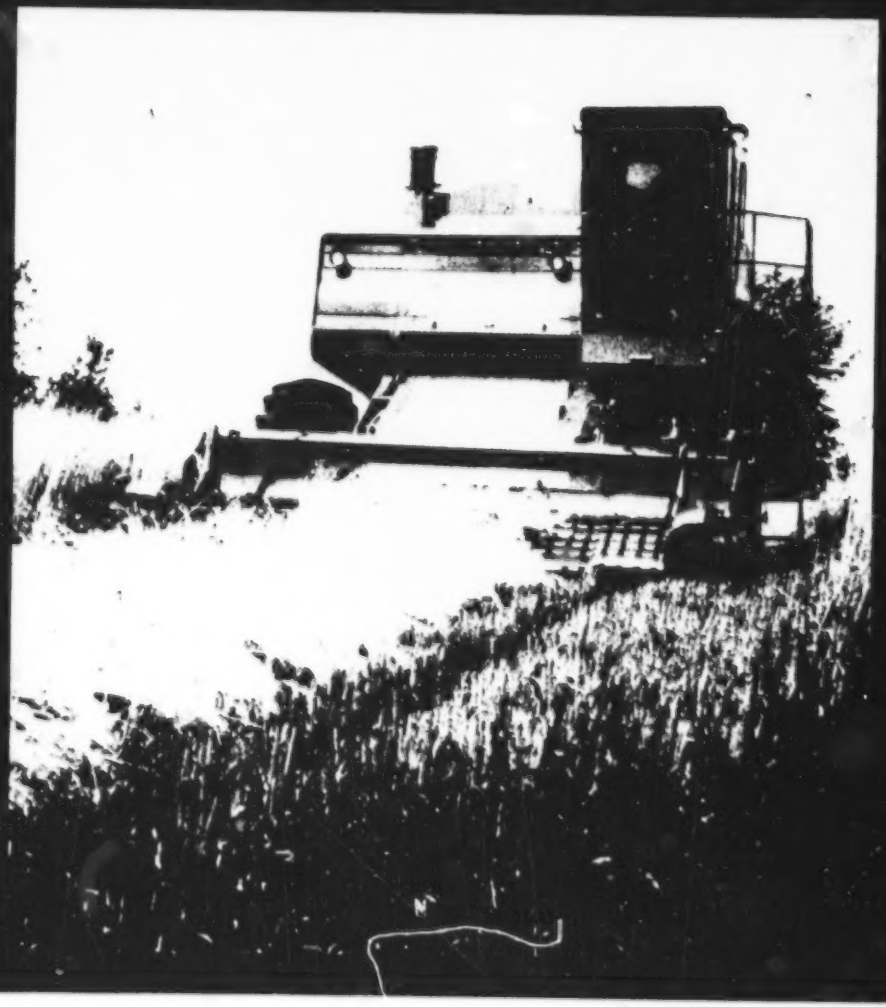
farm machinery costs
as a guide to custom rates

1987



PREFACE

Since 1975, Alberta Agriculture has annually published this guide to machinery costs. This publication provides current machinery cost information as a basis for budgeting machinery costs. The best decision information, however, is the actual costs for your specific machine. Because of the variability in machinery cost between farms, we encourage use of the worksheets (on page 13 and 14) to calculate these costs for your farm. A custom operator's costs are only one side of the negotiations. Market rates for the past 1986 season provide a second reference point.

It continues to be difficult to accurately estimate the replacement cost of machines. Creative pricing programs and variation between dealers tended to obscure the real capital cost of equipment. Although the list price has increased slightly in many cases, the net price after a deal is made has not increased significantly. It certainly pays to shop around for both machines and financing deals in what has to be called a buyers market this spring. Operating costs are expected to increase in the early spring as the world oil price increase is reflected in higher fuel prices. Fuel rebates may lower the on-farm cost of fuel. Interest rates, unpredictable at best, are expected to range slightly higher.

We gratefully acknowledge the services of Cal Ausenhus who again conducted the machinery cost survey. Gerd Andres and Garth Nickorick from the Farm Business Management Branch of Alberta Agriculture also contributed to updating this publication. The Market Rate Survey data was provided from a joint-project with Statistics Branch.

We draw your attention to the cover on the back of this publication. Since 1984, we have produced a publication titled "Directory of Custom Operators In Alberta". Our plan is to prepare a similar Directory of Custom Operators for 1988. It is an opportunity to advertise your services to other farmers. Your cooperation in contributing to this directory will be appreciated.

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INTRODUCTION

Custom charges for farm operations can be arrived at in two ways:

1) Use the going rate for the job. The commercial market rates are surveyed and reported continuously by the Farm Business Management Branch. Relevant 1986 figures are listed in the "Market Rate" column of the cost tables in the text.
2) Determine the operating and ownership costs and set the rate at a level such that some or all of the costs plus profit are covered.

This publication outlines steps in the buildup of costs incurred by some of the machinery units used in field and livestock operations.

ASSUMPTIONS

1) Estimated years of life, annual hours of use and annual repair rates are specified for each class of machine.
2) Interest on average machine investment is charged at 10% per year.
3) Diesel fuel is charged at $.12 per litre, purple gas at $.15 per litre and propane at $.15 per litre. (Changes in diesel and propane prices can be costed from the litres per hour usage estimates, then applied to total cost per hour).
4) Calculations follow the procedures on page 13 and the assumptions included on pages 15 and 16.

FIXED COSTS

Hours of annual use have a major effect on fixed costs per hour. Three levels of annual use are listed for 2 WD tractors and combines, so as to guide realistic custom or rental pricing. The tractor costs associated with a 400 hour annual use are used in costing out all tractor driven operations. Substitute the 200 or 600 rates if they are more applicable.

If your annual use figures differ greatly from those listed, use this formula to adjust your Fixed Costs (FC) Per Hour:

$$\text{Your FC/HR} = \frac{\text{Quoted FC/Hr} \times \text{Quoted Annual Use In Hours}}{\text{Your Annual Use In Hours}}$$

HOW TO USE THE GUIDE

1) If you are a full-time custom operator, then use the Total Machine Cost + Labor + Profit for estimating a charge. Be sure to adjust fixed costs if your annual hours of use differ much from those quoted. The profit margin can be adjusted to meet the market conditions.

2) If you are doing custom work on a good neighbor payment basis, then fixed costs of owning the machine may be ignored since they represent an annual cost incurred whether or not custom work is done. However, the rate should cover all variable costs which include an allowance for repairs. Labor and profit margin can be adjusted to meet each situation.

3) If you plan to do custom work in addition to your own work, so as to partly justify ownership of a larger machine, then the custom charge should cover variable costs, labor, a profit margin plus a proportion of fixed costs calculated as follows:

$$\text{Proportion of Fixed Costs} = \frac{\text{Hours of Custom Work}}{\text{Total Annual Hours of Use}} \times \text{Total Fixed Costs}$$

4) If you are renting out machinery, then you will wish to at least cover fixed costs and those variable costs such as lubrication and repairs which may not be already covered by the renter.
5) If you wish to assess a rate for a full operation such as silage making, which requires several machines, then add the hourly costs of each activity, making sure that there is neither omission nor duplication of men and units. Use worksheets on pages 13 and 14.
6) The purchase cost estimates are based on average cash prices as of February, 1987 for each class of machine. These represent current replacement costs which should be budgeted and charged for, even if you do custom work with older machines, unless the older machine will not do a comparable job.

OTHER CONSIDERATIONS

1) Favorable or unfavorable working conditions such as size of job, distance, access, contour, soil type and possible down time, must modify the guide figures. Per hour charges allow for some of these situations.
2) Charges per unit of output such as per acre, per bushel or per bale, defined on work rates per hour, may be quite different from those quoted. Per hour charging overcomes some of these uncertainties.
3) You can adjust the labor charge according to your actual cost of hired work or the opportunity cost of your own labor.
4) If your experience and farm records suggest that other costs and assumptions would suit your situation, then recalculate using the worksheets.
5) Earlier and faster may be cheaper.
There are costs attached to late completion of operations. The rewards for timely quality work, quickly completed by large machines, is only earned if the support system, including seed and fertilizer supplies and grain trucking, is well organized.
6) Such factors as tax and equity in farm machinery influence costs, but are not considered here.

OTHER INFORMATION SOURCES

Custom Rates Survey Summary-1987, Alberta Agriculture, Agdex 825-9, February 1987
Directory of Custom Operators in Alberta 1987, Alberta Agriculture, Agdex 825-17, March 1987
Know Your Farm Machinery Costs, Alberta Agriculture, Agdex 825-6, January 1984
Leasing vs. Buying Farm Machinery, Alberta Agriculture, Agdex 825-19, May 1985
Replacing Farm Machinery, Alberta Agriculture, Agdex 825-18, July 1983
What Is A Fair Charge For Custom Work?, Alberta Agriculture, Agdex 825-15, July 1983

TRACTORS - 2WD

Years Life = 13
Annual Use = 200, 400*, 600
Annual Repair Rate = 3% of Replacement Cost

	Annual Hours Used	Diesel Use	Current Replace Cost	Fixed Cost	Variable Cost	TOTAL Machine Cost	Labor	Profit	Market Rate Survey
		litres/Hr	$	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr	1986
40 HP	200	8	19000	12.75	2.53	15.28			$.20 per PTO HP/HR
	400			6.38		8.90			
	600			4.25		6.78			
60 HP	200	13	24000	16.11	3.59	19.70			
	400			8.05		11.65			
	600			5.37		8.96			
80 HP	200	17	30000	20.13	4.60	24.73			
	400			10.07		14.66			
	600			6.71		11.31			
100 HP	200	22	50000	33.56	6.79	40.34			$.18 per PTO HP/HR
	400			16.78		23.56			
	600			11.18		17.97			
120 HP	200	28	55000	36.91	7.99	44.90			
	400			18.46		26.45			
	600			12.30		20.29			
140 HP	200	32	61000	40.94	8.99	49.93			
	400			20.47		29.46			
	600			14.65		22.64			
160 HP	200	38	68000	45.64	10.34	55.98			
	400			22.82		33.16			
	600			15.22		25.56			
180 HP	200	39	73000	48.99	10.86	59.85			
	400			24.50		35.35			
	600			16.33		27.19			

* This Annual Hours Use figure is typical.

Front wheel assist option at $6,000 - $10,000 adds $2.50 - $4.25 per hour to total machine cost.

Years Life = 13
Annual Use = 200, 400*, 600
Annual Repair Rate = 3% of Replacement Cost

TRACTORS - 4WD

	Annual Hours Used	Diesel Use	Current Replace Cost	Fixed Cost	Variable Cost	TOTAL Machine Cost	Labor	Profit	Market Rate Survey
		litres/Hr	$	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr	1986
175 HP	200	34	72000	48.32	10.09	**58.42**			$.18 per PTO HP/HR
	400			24.16		**34.25**			
	600			16.11		**26.20**			
220 HP	200	40	90000	60.40	12.27	**72.67**			
	400			30.20		**42.47**			
	600			20.13		**32.40**			
250 HP	200	50	97000	65.10	14.18	**79.28**			
	400			32.55		**46.73**			
	600			21.70		**35.88**			
275 HP	200	53	117000	78.53	16.09	**94.61**			
	400			39.26		**55.35**			
	600			26.17		**42.26**			
300 HP	200	58	125000	83.89	17.38	**101.27**			
	400			41.95		**59.33**			
	600			27.96		**45.34**			
350 HP ***	200	62	135000	90.61	18.68	**109.29**			
	400			45.30		**63.98**			
	600			30.20		**48.88**			
450 HP ***	200	85	160000	107.38	23.73	131.11			
	400			53.69		77.42			
	600			35.79		59.52			

* This Annual Hours Use figure is typical.

*** Priced without PTO.

CULTIVATION EQUIPMENT

Implement	Tractor HP	Current Replace Cost	POWER UNIT OR SP UNIT Fixed Cost	POWER UNIT OR SP UNIT Variable Cost	IMPLEMENT Fixed Cost	IMPLEMENT Variable Cost	TOTAL Machine Cost $/Hr	TOTAL Machine Cost Acre/Hr	TOTAL Machine Cost $/Acre	Labor $/	Profit $/	Market Rate Survey 1986
		$	$/Hr	$/Hr	$/Hr	$/Hr						
PLOWS	Life = 15		Annual Hours Use = 150				Annual Repair Rate = 6% Replace Cost					
3 X 16" 3 Point	60	4500	8.05	3.59	3.75	1.80	17.20	2.0	8.60			$20.00 - $22.00 per Acre
5 x 16" Semi 3 pt	120	8500	18.46	7.99	7.08	3.40	36.93	3.0	12.31			
6 x 18" Trailing	140	11000	20.47	8.99	9.17	4.40	43.03	4.0	10.76			
8 x 16" Trailing	220	12500	30.20	12.27	10.42	5.00	57.89	6.0	9.65			
10 x 18" Trailing	250	16000	32.55	14.18	13.33	6.40	66.46	7.0	9.49			
HD CULTIVATORS W/ MULTIPLEX HARROWS	Life = 15		Annual Hours Use = 250				Annual Repair Rate = 6% Replace Cost					
14' Single	80	8000	10.07	4.60	4.00	1.92	20.58	7.0	2.94			$3.00 - $6.00 per Acre
22' Wing	120	12500	18.46	7.99	6.25	3.00	35.70	11.0	3.25			
31' Wing	160	19000	22.82	10.34	9.50	4.56	47.22	15.0	3.15			
42' Wing	220	22000	30.20	12.27	11.00	5.28	58.75	20.0	2.94			
60' Wing	350	32000	45.30	18.68	16.00	7.68	87.66	30.0	2.92			
FIELD CULTIVATORS W/ MULTIPLEX HARROWS	Life = 15		Annual Hours Use = 250				Annual Repair Rate = 6% Replace Cost					
16' Wing	60	8000	8.05	3.59	4.00	1.92	17.57	8.5	2.07			
22' Wing	80	10500	10.07	4.60	5.25	2.52	22.43	12.0	1.87			
32' Wing	120	12500	18.46	7.99	6.25	3.00	35.70	17.0	2.10			
42' Wing	160	18000	22.82	10.34	9.00	4.32	46.48	22.0	2.11			
DISCS - TANDEM HD	Life = 15		Annual Hours Use = 150				Annual Repair Rate = 6% Replace Cost					
16' Single	100	10000	16.78	6.79	8.33	4.00	35.90	7.5	4.79			$ 5.00 - $10.00 per Acre
24' Wing	140	22000	20.47	8.99	18.33	8.80	56.59	12.0	4.72			
30' Wing	220	25000	30.20	12.27	20.83	10.00	73.31	16.5	4.44			
16' Heavy Offset	140	18000	20.47	8.99	15.00	7.20	51.66	7.5	6.89			
ROTOVATORS	Life = 15		Annual Hours Use = 100				Annual Repair Rate = 6% Replace Cost					
5' Rotor	80	9000	10.07	4.60	11.25	5.40	31.31	1.5	20.88			
6' Rotor	120	12500	18.46	7.99	15.63	7.50	49.57	2.5	19.83			
V-BLADE	Life = 15		Annual Hours Use = 150				Annual Repair Rate = 6% Replace Cost					
21'	100	13000	16.78	6.79	10.83	5.20	39.60	11.0	3.60			
28'	160	16000	22.82	10.34	13.33	6.40	52.90	15.0	3.53			
42'	250	25000	32.55	14.18	20.83	10.00	77.56	20.0	3.88			

400 Annual Hours of Tractor Use figures are used to determine above Power Unit Costs.

Implement	Tractor HP	Current Replace Cost	POWER UNIT OR SP UNIT Fixed Cost	POWER UNIT OR SP UNIT Variable Cost	IMPLEMENT Fixed Cost	IMPLEMENT Variable Cost	TOTAL Machine Cost $/Hr	TOTAL Machine Cost Acre/Hr	TOTAL Machine Cost $/Acre	Labor $/	Profit $/	Market Rate Survey 1986
		$	$/Hr	$/Hr	$/Hr	$/Hr						
ROD WEEDER WITH MULTIPLEX HARROWS	Life = 15		Annual Hours Use = 150				Annual Repair Rate = 6% Replace Cost					
24'	100	9000	16.78	6.79	7.50	3.60	**34.66**	12.0	**2.89**			
36'	120	12500	18.46	7.99	10.42	5.00	**41.86**	16.0	**2.62**			
48'	160	18000	22.82	10.34	15.00	7.20	**55.36**	25.0	**2.21**			
HARROWS	Life = 15		Annual Hours Use = 40				Annual Repair Rate = 2% Replace Cost					$2.00 - $3.50 per Acre
Spring Tooth 50'	80	7000	10.07	4.60	21.87	3.50	**40.04**	35.0	**1.14**			
Spring Tooth 70'	120	9000	18.46	7.99	28.12	4.50	**59.07**	48.0	**1.23**			
Harrow Packers 40'	140	16000	20.47	8.99	50.00	8.00	**87.46**	25.0	**3.50**			
Harrow Packers 70'	180	21000	24.50	10.86	65.62	10.50	**111.48**	44.0	**2.53**			
SEED DRILLS	Life = 15		Annual Hours Use = 100				Annual Repair Rate = 2% Replace Cost					$5.00 - $7.00 per Acre
Press Drills 12'	60	15000	8.05	3.59	18.75	3.00	**33.40**	6.5	**5.14**			
End Wheel 12'	60	8500	8.05	3.59	10.63	1.70	**23.97**	6.5	**3.69**			
Hoe Drill 12'	60	15000	8.05	3.59	18.75	3.00	**33.40**	6.5	**5.14**			
Zero/Min. Till 12'	60	18000	8.05	3.59	22.50	3.60	**37.75**	4.5	**8.39**			
AIR SEEDER WITH CULTIVATORS	Life = 15		Annual Hours Use = 150				Annual Repair Rate = 3% Replace Cost					
28'	140	33000	20.47	8.99	27.50	6.60	**63.56**	16.5	**3.85**			
42'	250	47000	32.55	14.18	39.17	9.40	**95.29**	25.0	**3.81**			
45' WITH PACK WHEELS	250	62000	32.55	14.18	51.67	12.40	**110.79**	27.0	**4.10**			
SPRAYER (TRAILER)	Life = 15		Annual Hours Use = 50				Annual Repair Rate = 3% Replace Cost					
400 Gallon 68'	60	8000	8.05	3.59	20.00	4.80	**36.45**	35.0	**1.04**			
800 Gallon 80'	60	10000	8.05	3.59	25.00	6.00	**42.65**	47.0	**0.91**			$2.00 - $3.50 per Acre
SPRAYER (SP)	Life = 10		Annual Hours Use = 100				Annual Repair Rate = 3% Replace Cost					
130 Gallon 54'	60	17000	26.35	5.10			**31.45**	40.0	**0.79**			
1000 Gal 54' Float	160	110000	170.50	33.00			**203.50**	85.0	**2.39**			
320 Gallon 45' + 3/4 Ton 4x4	60	20000	31.00	6.00			**37.00**	35.0	**1.06**			

400 Annual Hours of Tractor Use figures are used to determine above Power Unit Costs.

FORAGE EQUIPMENT

Implement	Tractor HP	Current Replace Cost	POWER UNIT OR SP UNIT Fixed Cost	POWER UNIT OR SP UNIT Variable Cost	IMPLEMENT Fixed Cost	IMPLEMENT Variable Cost	TOTAL Machine Cost $/Hr	TOTAL Machine Cost Acre/Hr	TOTAL Machine Cost $/Acre	Labor $/	Profit $/	Market Rate Survey
		$	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr	Acre/Hr	$/Acre	$/	$/	1986
SWATHER (SP)	Life = 15		Annual Hours Use = 100				Annual Repair Rate = 3% Replace Cost					
16' Forage & Grain + Conditioner	60	28000	35.00	10.19			45.19	7.0	6.46			
20' Grain	60	24000	30.00	8.99			38.99	10.0	3.90			
SWATHER (PULL-TYPE)	Life = 15		Annual Hours Use = 100				Annual Repair Rate = 3% Replace Cost					$4.00 - $5.00 per Acre
15' Grain	40	5500	6.38	2.53	6.87	1.65	17.43	7.5	2.32			
24' Grain	60	7000	8.05	3.59	8.75	2.10	22.50	12.0	1.87			
MOWER	Life = 15		Annual Hours Use = 50				Annual Repair Rate = 2% Replace Cost					
7'	40	4000	6.38	2.53	10.00	1.60	20.50	3.0	6.83			
MOWER CONDITIONER	Life = 15		Annual Hours Use = 100				Annual Repair Rate = 3% Replace Cost					
14' SP Diesel	70	43000	53.75	15.16			68.91	7.0	9.84			$ 6.00 - $10.00 per Acre
9' PTO	60	13000	8.05	3.59	16.25	3.90	31.80	5.0	6.36			
14' PTO	80	18000	10.07	4.60	22.50	5.40	42.56	6.5	6.55			
RAKE	Life = 15		Annual Hours Use = 50				Annual Repair Rate = 2% Replace Cost					
9' Parallel Bar	40	4000	6.38	2.53	10.00	1.60	20.50	5.0	4.10			
FORAGE HARVESTER	Life = 12		Annual Hours Use = 100				Annual Repair Rate = 3% Replace Cost					
20"	120	18000	18.46	7.99	25.20	5.40	57.05					$100.00 - $125.00 per Acre
26"	180	24000	24.50	10.86	33.60	7.20	76.15					
DUMP WAGON	Life = 15		Annual Hours Use = 100				Annual Repair Rate = 2% Replace Cost					
Small (700 cu ft)	0	8000	10.00	1.60			11.60					
Large (900 cu ft)	0	11000	13.75	2.20			15.95					

400 Annual Hours of Tractor Use figures are used to determine above Power Unit Costs.

Implement	Tractor HP	Current Replace Cost	POWER UNIT OR SP UNIT Fixed Cost	POWER UNIT OR SP UNIT Var Cost	IMPLEMENT Fixed Cost	IMPLEMENT Var Cost	TOTAL Machine Cost			Twine Cost	Total Cost	Labor	Profit	Market Rate Survey
		$	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr	Bale/Hr	$/Bale	$/Bale	$/Bale	$/	$/	1986
BALERS (STANDARD)	Life = 10		Annual Hours Use = 80				Annual Repair Rate = 3%		Replace Cost					
Small 14" x 18"	40	10500	6.38	2.53	20.34	3.94	33.19	200	**0.17**	0.08	**0.25**			$ .25 - $ .35 per Bale
Large 16" x 18"	60	13500	8.05	3.59	26.16	5.06	42.87	300	**0.14**	0.08	**0.22**			
LARGE ROUND	Life = 12		Annual Hours Use = 60				Annual Repair Rate = 2%		Replace Cost					
800 Lb. Bale	60	16000	8.05	3.59	37.33	5.33	54.31							$5.00 - $7.00 per Bale
1500 Lb. Bale	60	19000	8.05	3.59	44.33	6.33	62.31							
BIG SQUARE	Life = 10		Annual Hours Use = 150				Annual Repair Rate = 3%		Replace Cost					
1500-2000 Lb. Bale	160	77000	22.82	10.34	79.57	15.40	128.13							
BALE WAGONS	Life = 12		Annual Hours Use = 80				Annual Repair Rate = 3%		Replace Cost					
SP 160 Bale DS	40	73000	127.75	27.37			155.12	400	**0.39**	0.00	**0.39**			$ .25 per Bale
PULL 142 Bale	80	28000	10.07	4.60	49.00	10.50	74.16	300	**0.25**	0.00	**0.25**			
PULL 104 Bale	60	22000	8.05	3.59	38.50	8.25	58.40	240	**0.24**	0.00	**0.24**			
PULL 55 Bale	40	13000	6.38	2.53	22.75	4.87	36.53	160	**0.23**	0.00	**0.23**			
STACKERS	Life = 12		Annual Hours Use = 80				Annual Repair Rate = 3%		Replace Cost					
4 ton Rectangular	80	20000	10.07	4.60	35.00	7.50	57.16							
8 ton Rectangular	120	28000	18.46	7.99	49.00	10.50	85.95							

400 Annual Hours of Tractor Use figures are used to determine above Power Unit Costs.

COMBINES

Years Life = 13
Annual Use = 100, 150*, 200
Annual Repair Rate = 3% of Replacement Cost

Combine Cylinder Width	Annual Hours Use	Current Replace Cost	POWER UNIT OR SP UNIT Fixed Cost	POWER UNIT OR SP UNIT Variable Cost	PTO MACHINE Fixed Cost	PTO MACHINE Variable Cost	TOTAL Machine Cost $/Hr	TOTAL Machine Cost Ac/Hr	TOTAL Machine Cost $/Acre	Labor $/	Profit $/	Market Rate Survey 1986
		$	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr	Ac/Hr	$/Acre	$/	$/	1986
POWER TAKE OFF	100				56.38		**91.22**		**15.20**			
44-50 IN CYLINDER	150	42000	18.46	7.99	37.38	8.40	**72.43**	6.0	**12.07**			
(Tractor HP = 120)	200				28.19		**63.03**		**10.51**			
LARGE PTO	100				67.25		**135.60**		**15.95**			
JD7721,CASE1682,VERS	150	65000	24.50	10.86	58.17	13.00	**106.52**	8.5	**12.53**			
(Tractor HP = 180)	200				43.63		**91.98**		**10.82**			
SP DIESEL	100		96.65				**114.08**		**20.74**			
45 INCH	150	72000	64.43	17.44			**81.87**	5.5	**14.88**			
(HP = 100)	200		48.32				**65.76**		**11.96**			
SP DIESEL	100		118.12				**139.59**		**21.47**			
50 INCH	150	88000	78.75	21.46			**100.21**	6.5	**15.42**			
(HP = 120)	200		59.06				**80.53**		**12.39**			
SP DIESEL	100		134.23				**158.65**		**18.66**			$12.00 -
60 INCH	150	100000	89.49	24.42			**113.90**	8.5	**13.40**			$14.00
(HP = 140)	200		67.12				**91.53**		**10.77**			per
ROTARY TYPE	100		114.10				**135.51**		**19.36**			Acre
(SMALL)	150	85000	76.06	21.42			**97.48**	7.0	**13.93**			
TR76,CASE1640	200		57.05				**78.46**		**11.21**			
ROTARY TYPE	100		148.63				**174.33**		**20.51**			
(MEDIUM) (HP = 175)	150	115000	99.09	25.69			**124.78**	8.5	**14.68**			
CASE1660,TR86,ACR5	200		74.32				**100.01**		**11.77**			
ROTARY TYPE	100		170.47				**201.26**		**21.18**			
(LARGE) (HP = 185)	150	127000	113.65	30.78			**144.43**	9.5	**15.20**			
CASE1680,TR96,ACR6	200		85.24				**116.02**		**12.21**			
ROTARY TYPE	100		194.63				**230.53**		**21.96**			
(LARGEST) (HP = 250)	150	145000	129.76	35.90			**165.66**	10.5	**15.78**			
ACR7,WHITE9720	200		97.32				**133.22**		**12.69**			

* The 150 Annual Hours Use figure is typical.

400 Annual Hours of Tractor Use figures are used to determine above Power Unit Costs.

Implement	Tractor HP	Current Replace Cost	POWER UNIT OR SP UNIT Fixed Cost	POWER UNIT OR SP UNIT Variable Cost	IMPLEMENT Fixed Cost	IMPLEMENT Variable Cost	TOTAL Machine Cost	Tonnes/Hr	Labor	Profit	Market Rate Survey
		$	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr	$/Tonne	$/	$/	1986
TUB GRINDER Life = 12 Annual Hours Use = 80 Annual Repair Rate = 3% Replace Cost											
15 Tonnes/Hour	80	14000	10.07	4.60	24.50	5.25	44.41	15.0	2.96		
25 Tonnes/Hour	140	22000	20.47	8.99	38.50	8.25	76.21	25.0	3.05		
PORTABLE GRINDER/MIX Life = 10 Annual Hours Use = 80 Annual Repair Rate = 3% Replace Cost											
20" Screen	80	9500	10.07	4.60	18.41	3.56	36.63				
24" Screen & Bale Shredder	100	14500	16.78	6.79	28.09	5.44	57.10				

GRAIN DRYERS Life = 12 Annual Hours Use = 200 Annual Repair Rate = 3%	Tractor HP	Current Replace Cost	POWER UNIT OR SP UNIT Fixed Cost	POWER UNIT OR SP UNIT Variable Cost	IMPLEMENT Fixed Cost	IMPLEMENT Variable Cost	TOTAL Machine Cost	Moisture Drop 20-14% $/Tonne	Moisture Drop 17.5-14% $/Tonne	Market Rate Survey
		$	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr	$/Tonne	$/Tonne	1986
RECIRCULATING BATCH										
Small Propane = 37 L/Hr	40	10500	6.38	2.53	7.35	7.12	23.38	17.98 (1.3T/Hr)	11.69 (2.0T/Hr) BU	$ .04 - $ .06 per point
Medium Propane = 46 L/Hr	40	16000	6.38	2.53	11.20	9.30	29.40	17.30 (1.7T/Hr)	11.31 (2.6T/Hr) BU	
Large Propane = 90 L/Hr	40	25000	6.38	2.53	17.50	17.25	43.65	10.91 (4.0T/Hr)	7.28 (6.0T/Hr) BU	$ .20 - $ .28 per bushel
CONTINUOUS FLOW										
Small Propane = 90 L/Hr	40	20000	6.38	2.53	14.00	16.50	39.40	11.94 (3.3T/Hr)	7.58 (5.2T/Hr) BU	$40.00 - $60.00 per hour
Medium Propane = 110 L/Hr	40	28000	6.38	2.53	19.60	20.70	49.20	11.18 (4.4T/Hr)	7.03 (7.0T/Hr) BU	
Large Propane = 145 L/Hr	40	45000	6.38	2.53	31.50	28.50	68.90	10.60 (6.5T/Hr)	7.03 (9.8T/Hr) BU	

400 Annual Hours of Tractor Use figures are used to determine above Power Unit Costs.

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FARM TRUCKS, ROCK PICKERS & VACUVATORS

Years Life = 15
Annual Use = 150, 300*, 450
Annual Repair Rate = 3% of Replacement Cost

Truck Size	Annual Hours Used	Fuel Use	Current Replace Cost	Fixed Cost	Variable Cost	TOTAL Truck Cost	Labor	Profit		Market Rate Survey
		litres/Hr	$	$/Hr	$/Hr	$/Hr	$/Hr	$/	$/	1986
GENERAL TRUCKING	Life = 15	Annual Hours Use = 150		Annual Repair Rate = 3% of Replacement Cost						
2 Ton	150	30.00	21000	17.50	6.93	**24.43**				$4.00 - $8.00 per Tonne (Short Haul)
	300			8.75		**15.68**				
	450			5.83		**12.76**				
3 Ton	150	37.00	26000	21.67	8.56	**30.22**				
	300			10.83		**19.39**				
	450			7.22		**15.78**				
4 Ton	150	45.00	30000	25.00	10.25	**35.25**				
	300			12.50		**22.74**				
	450			8.33		**18.58**				
5 Ton Tandem	150	52.00	38000	31.67	12.17	**43.84**				
	300			15.83		**28.01**				
	450			10.56		**22.73**				

Implement	Tractor HP	Current Replace Cost	POWER UNIT OR SP UNIT Fixed Cost	POWER UNIT OR SP UNIT Variable Cost	IMPLEMENT Fixed Cost	IMPLEMENT Variable Cost	TOTAL Machine Cost			Labor	Profit	Market Rate Survey
		$	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr	Acre/Hr	$/Acre	$/	$/	1986
ROCK PICKER	Life = 10		Annual Hours Use = 150				Annual Repair Rate = 6% Replace Cost					
REEL TYPE	60	7200	8.05	3.59	7.44	2.88	21.96					
ROCK RAKE	60	5700	8.05	3.59	5.59	2.28	19.82					
RAKE - PICKER COMBO	80	11500	10.07	4.60	11.88	4.60	31.15					
VACUVATORS	Life = 15		Annual Hours Use = 150				Annual Repair Rate = 3% Replace Cost					
SMALL	80	7500	10.07	4.60	6.25	1.50	22.41	700 bu	0.03 bu			
LARGE	100	14000	16.78	6.29	11.67	2.80	38.03	1900 bu	0.02 bu			

400 Annual Hours of Tractor Use figures are used to determine above Power Unit Costs.

MACHINERY COST WORKSHEET

Machine.....**Original Cost**.....**Annual Hours of Use**.....

Replacement Cost .....**Sale Value**.....**Years of Use**.....

			Yearly Cost	Hourly Cost
FIXED COSTS (Calculated on Yearly Basis)				
1. Depreciation	= Replacement Cost - Cash Sale Value / Years of Use	$..... - $..... / .....Years	$ _____	
2. Investment Cost	= Original Cash Cost + Cash Sale Value / 2 X Interest Rate	$..... + $..... / 2 X .....%	$ _____	
3. Insurance & Housing	= Original Cash Cost X 1%	$..... X .....%	$ _____	
4. TOTAL FIXED COSTS PER YEAR			$ ═══ (A)	
5. TOTAL FIXED COSTS/HOUR	= Total Costs/Year/Hours of Annual Use	$..... / $.....hr		$ ═══ (B)
VARIABLE COSTS (Calculated on Hourly Basis) (use following formulas if actual costs are not known)				
1. Fuel Cost	= Litre/Hour X Price/Litre	..... X $..... X	$_____	
2. Lubrication	= Fuel Cost X 15%	$..... X .....%	$_____	
3. Repairs	= Original Purchase Price X Annual Repair Rate / Hours of Annual Use	$..... X .....% / .....hrs	$_____	
4. TOTAL VARIABLE COSTS PER HOUR				$ ═══ (C)
5. TOTAL VARIABLE COSTS PER YEAR	= Total Variable Costs/Hour X Hours of Annual Use	$..... X .....hr	$ ═══ (D)	

TOTAL COSTS PER YEAR (A+D) = $..... + $..... $ _____

TOTAL COSTS PER HOUR (B+C) = $..... + $..... $ _____

MACHINERY CUSTOM CHARGE WORKSHEET[1]

Operation ..... Power Unit ..... Implement(s) ..... Acres/Hour .....

	Power Unit	Machine 1	Machine 2
FIXED COSTS PER HOUR[2]			
A. Depreciation	$ _____	$ _____	$ _____
B. Investment Cost	$ _____	$ _____	$ _____
C. Insurance & Housing	$ _____	$ _____	$ _____
D. Total Fixed Cost (A+B+C)	$ _____ (P)	$ _____ (R)	$ _____ (S)
E. Total Fixed Machine(s) Costs (P+R+S)			$ _____ (E)
VARIABLE COSTS PER HOUR[3]			
F. Fuel Cost	$ _____		
G. Lubrication	$ _____	$ _____	$ _____
H. Repairs	$ _____	$ _____	$ _____
I. Total Variable Cost (F+G+H)	$ _____ (T)	$ _____ (U)	$ _____ (V)
J. Total Variable Machine Cost (T+U+V)			$ _____ (J)
K. TOTAL MACHINE COST PER HOUR (F+J)		$ _____ (K)	
L. LABOR COST PER HOUR		$ _____ (L)	
M. PROFIT MARGIN (20-50% of Variable Cost + Labor)		$ _____ (M)	
N. FULL COST + PROFIT (K+L+M)		$ _____ (N)	
O. TOTAL CHARGE/ACRE (N ÷ Acres/Hour)		$ _____	

1 Before using this worksheet, calculate the costs of each machine using the "Machinery Cost Worksheet".
2 Refer to Machinery Cost Worksheet and divide by annual hours of use.
3 Refer to Machinery Cost Worksheet.

FUEL CONSUMPTION FOR VARYING TRACTOR HORSEPOWER[1]

TRACTOR TYPE AND SIZE	AVERAGE DRAWBAR HORSEPOWER[2]		AV. FUEL CONSUMPTION[3] (Litres per Hour)	
	Diesel Tractors	Gasoline Tractors	Diesel Tractors	Gasoline Tractors
Two Wheel Drive PTO HP				
30 - 39	....	31.5	....	10.5
40 - 49	....	38.3	....	12.3
50 - 59	48.2	47.1	10.5	15.0
60 - 69	56.2	55.2	13.6	20.0
70 - 79	65.5	64.5	16.4	23.2
89 - 89	73.5	74.5	17.7	26.8
90 - 99	84.0	82.0	20.5	28.2
100 - 119	90.3	....	22.7	....
120 - 139	111.6	....	28.2	....
140 - 159	128.9	....	32.3	....
160 - 179	145.8	....	38.6	....
Over 180	148.9	....	39.1	....
Four Wheel Drive DBHP				
100 - 149	135.0	....	33.2	....
150 - 174	159.4	....	40.3	....
175 - 199	182.8	....	50.0	....
200 - 224	217.4	....	53.0	....
225 - 249	235.5	....	58.0	....
250 - 274	265.0	....	61.4	....
275 - 299	281.3	....	62.6	....
300 - 349 *	305.0	....	66.4	....
Over 350 *	385.0	....	92.4	....

* Includes only one tractor

1 This data was summarized from "Nebraska Tractor Test Summary 1972 through 1981", The Grain Grower, Page 762 (UGG), April, 1982 and from 1980 - 1981, Agricultural Yearbook, A.S.A.E, May, 1980, pp 537-545.
2 Average Drawbar Horsepower for all tractors in each range.
3 Average fuel consumption for all tractors in each range.

NOTES ON FUEL CONSUMPTION TABLE

This data on fuel consumption for different sizes of tractors was calculated from the Nebraska Tractor Tests Reports. The fuel consumption figures are based on "75% of Pull at Maximum Power". These fuel consumption figures are for tractors under normal load in average field conditions. Fuel use per hour will be affected by:-

- load factor (75% is assumed in these estimates
- engine RPM
- gear
- correct engine tuning

While these figures may be a good indication of fuel use per hour for a machine, fuel consumption per acre will be affected by the Field Efficiency related to each operation. Estimation of total fuel consumption should take this factor into account. Some factors that can significantly affect field efficiency include:-

- wheel slippage
- tire pressure
- tractor ballast
- depth of and sharpness of implement
- soil type and condition
- amount of turning required
- implement overlap in each pass
- down time to refill seed and fertilizer boxes

MACHINERY COSTS ASSUMPTION GUIDE

MACHINE	A Depreciation Lifetime (Years)	B Annual Use (Hours)	C Annual Repair rate % orig.Cost	D Lifetime Repairs % orig.Cost	E Field Efficiency
Tractors	13	600	3%	120%	.....
Combines	12	150	3%	60%	60 - 80%
Cultivators	15	250	3-8%	120%	70 - 90%
Discers	15	150	3%	120%	70 - 90%
Rodweeders	15	100	2%	100%	70 - 90%
Seed Drills	15	100	2%	100%	65 - 80%
Harrows, Packers	15	40	2%	120%	70 - 90%
Sprayers	15	50	2%	80%	50 - 80%
Stone Pickers	15	40	2%	100%	50 - 80%
Swathers	15	100	3%	95%	70 - 85%
Mowers & Rakes	15	50	2%	100%	60 - 90%
Mower-Condtioner	15	50	2%	100%	60 - 85%
Forage Harvester	15	80	3%	80%	50 - 80%
Balers					
Standard	10	80	3%	80%	60 - 85%
Large Round	12	60	2%	60	60 - 85%
Grain Dryers	12	200	3%	...	.....
Loaders	15	40	2%	90%	.....

NOTES ON COLUMN HEADINGS

A. Estimated average number of years until a machine depreciates to 10% of original cash cost.

B. Estimated average annual farm use.

C. Estimates are based on average conditions and the indicated annual hours of use.

D. Total repairs as a percent of the original cash cost. Repairs are usually low in the first years before they begin to increase at an increasing rate as the machine wears out. These figures could be viewed as a maximum since they reflect high rates in later years.

E. Field Efficiency is a percentage estimate of the amount of time machinery is actually in use relative to the total time required to complete an operation (refer also opposite page).

ACRES PER HOUR

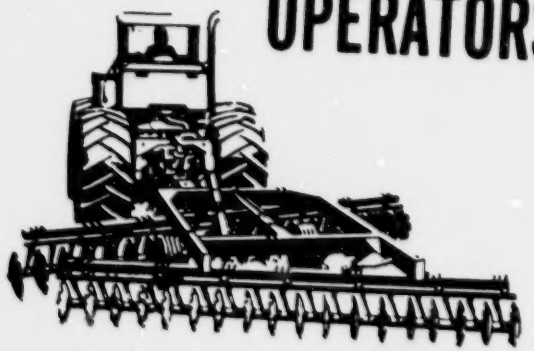
Acres per hour (or "Effective Field Capacity") can be calculated using the following formula:-

$$\text{Acres per hour (Effective field Capacity)} = \frac{\text{machine width (ft)} \times \text{speed (mph)} \times \text{field efficiency}}{8.25}$$

E.G. A 31' cultivator travelling at 5 m.p.h. operating at 80% field efficiency would have an effective field capacity of:-

$$\text{Acres per hour} = \frac{31 \times 5 \times .80}{8.25} = 15 \text{ ac/hr}$$

DIRECTORY OF FARM CUSTOM OPERATORS



ARE YOU IN IT?

1988 DIRECTORY

Alberta Agriculture will be publishing a 1988 **Directory of Custom Operators in Alberta.** The **directory** will benefit both custom operators and farmers. Farmers who want custom work done will know who the custom operator(s) are in their area, and custom operators will have a means to publicize their services. The only information in the directory will be the custom operator's name, town, phone number and type of service offered.

Custom operators interested in being included in the 1988 directory should complete and return the attached form by December 31, 1987. Operators who were listed in the 1987 directory must also submit the attached form for the 1988 directory.

PUBLICATIONS

Besides the directory, Alberta Agriculture also publishes the **Custom Rates Survey Summary** and **Farm Machinery Costs As A Guide to Custom Rates.** The **summary** contains actual custom charges surveyed in the previous year. The **guide** provides information about the cost of machinery ownership for the current year. Both may be useful in determining custom charges for the current year. The two publications contain worksheets on how to calculate machinery costs and machinery custom charges.

The above annual publications are available at your local Alberta Agriculture district office, or write to the Farm Business Management Branch, Box 2000, Olds, Alberta, T0M 1P0; or phone 556-4247.

Alberta
AGRICULTURE
Farm Business Management Branch

DIRECTORY OF CUSTOM OPERATORS

If you are a custom operator and want to be listed in the 1987 Directory, please check the services you offer

CULTIVATION
- ☐ Tillage
- ☐ Plowing
- ☐ Discing

GRAIN
- ☐ Seeding
- ☐ Swathing
- ☐ Combining
- ☐ Hauling
- ☐ Drying

APPLICATIONS
- ☐ Aerial
- ☐ Herbicide
- ☐ Insecticide
- ☐ Granular Fertilizer
- ☐ Liquid Fertilizer
- ☐ Anhydrous

LAND CLEARING
- ☐ Cutting
- ☐ Piling
- ☐ Repiling
- ☐ Root Raking

LIVESTOCK
- ☐ Feed Processing
- ☐ Fencing
- ☐ Corral Cleaning
- ☐ Hauling
- ☐ Custom Feeding

SILAGE
- ☐ Swathing
- ☐ Hauling
- ☐ Harvesting
- ☐ Blowing & Packing

HAYING
- ☐ Swathing
- ☐ Baling
- ☐ Hauling & Stacking
- ☐ Hauling

LAND BREAKING
- ☐ Plowing
- ☐ Discing
- ☐ Rototilling
- ☐ Rock Picking
- ☐ Drainage

☐ Other (Specify) _____

Please print your name, address and phone number.

For more information phone 556-4247.

NAME _____

ADDRESS _____

POSTAL CODE _____

PHONE _____